Imran Bashir

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I help business leaders quickly solve complex AI, ML and Computer Vision related engineering challenges, setup advanced system architecture, build DevOps/MLOps pipelines, upskill developers, cut costs and fast-track AI deployments.

Goal oriented and entrepreneurial individual, a change agent who has led organizations in creating innovative solutions to some of the toughest business challenges around. I know how to put technology to work to create competitive advantage, increase revenue, accomplish mission, and generate value. I can deliver results independently and as a leader of a team when it comes to AI/ML applications, DevOps, MLOps, cloud infrastructure setup, software development, mobile/web development, business development, and relationship building. I have been part of the C-suite Leadership yet I have the breadth of technical knowledge that I can personally code and automate the most complex technical solutions using cutting edge technologies. With 20+ years of building technology companies and hands-on IT experience in client facing roles, I have a knack for solving complex technical and business challenges. There is a proven track record of my ability to grow the business and the technical facets of a company with equal levels of excellence. I am passionate about IoT, AI, ML, cloud, mobile, computer vision and voice technology. I have years of experience building and managing onsite as well as geographically dispersed technology teams to deliver the cutting edge software and hardware products.

I hold **AWS Certified Solutions Architect- Professional** and **Certified Kubernetes Administrator (CKA)** certifications with focus towards building scalable and cost effective AI/IoT applications utilizing the latest trends such as containerized applications and distributed IoT and AI Edge platforms.

Transforming a traditional IT organization that is under pressure from digital disruptors requires superb technical, communication, and organizational skills. As a leader and a systems architect, I combine these traits to deploy a Lean Startup approach, using design thinking, minimum viable product development and growth hacking, to innovate and support the digital transformation with internal and external stakeholders and partners. Being an entrepreneur, I have a laser sharp focus on generating value for the business through technology development. I am very comfortable with making tough decisions and owning them to deliver business and technology innovation for my organization in order to keep pace with the accelerated competitive environment. What sets me apart is my relentless drive for speed of innovation which is not easy to achieve without a certain level of mental stamina and the ability to spend long hours to get things done.

Professional Experience

Principal AI & MLOps Platform Architect / Lead SRE
United Airlines, Chicago, IL (Feb 2023 - Present)

United Airlines has a team of 100+ data scientists working on a variety of ML and AI use cases including large language models (LLMs) like GPT3.5 and GPT4 from OpenAI. My role with United Airlines includes architecting and developing an AI Platform. The platform is used as a self service tool by the United engineers and data scientists to test, deploy, monitor and manage various AI applications.

The goal of the MLOps platform is to help data scientists and engineers to quickly develop, deploy and upgrade AI applications at scale.

I act as an advisor and consultant for the United leadership to help them make sound technology and business decisions. I also lead the architecture, design and prototyping of highly complex areas of the platform to make the platform more reliable and user friendly to increase the development team's efficiency. Those areas include:

- Generative AI Platform (AWS BedRock, Azure OpenAPI, LLM Model Fine-tuning)
- GenAI Apps (LangChain, Vector Databases, Prompt Engineering, Document Searches)
- AWS AI Services (Kendar, Lex, Polly, Rekognition and Textract)
- Site Reliability Engineering (SRE)
- Streaming Data Processing
- AI models deployment and upgrades in production
- Model training and experimentation
- Model auto-training and active learning
- MLOps
- FinOps (Cloud cost optimization)
- DevSecOps

Engineering Team Lead, Edge Practice - IoT/ML & Computer Vision
Fractal Analytics, New York, NY, USA (Feb 2022 - Present)

Fractal Analytics builds AI, Computer Vision and Video Analytics solutions for various clients in partnership with Microsoft, AWS and Nvidia. This includes respective AI services from these companies AWS AI Services, Azure Cognitive Services, SageMaker, Azure ML, Nvidia Metropolis and Deepstream etc.

My responsibilities at Fractal include leading a global team of developers to architect, engineer and deliver projects for various clients that fall under the company's IoT and Edge practice.

As the technology team lead, I bridge the gap between engineers, business stakeholders and the company clients to ensure timely delivery of AI projects within tightly defined scope and budget. Majority of my time is spent doing complex hands-on engineering to overcome ambiguity in building AI,

IoT and Video Analytics solutions at the edge. I have led projects with clients like Microsoft, Walgreens, TaylorMade Golf, Commscope and United Airlines.

IoT Architect and Engineer Medical Devices (Consultant)

Sysmex America, Lincolnshire, IL (September 2022 - April 2022)

Sysmex is a manufacturer of cutting-edge medical testing devices. The company is a global leader for hematology analyzers to do blood testing. The analyzers are used by medical labs and hospitals all over the globe.

My role with the company involves the following:

- Gather IoT requirements from global regions including Americas, EMEA, Asia Pacific & Europe
- Analyze current IoT implementations in the global regions and document the differences
- Understand challenges, gaps and opportunities to determine the best IoT strategy for the future
- Explore security, privacy and medical device compliance specifications in different countries
- Create RFPs to share with select IoT service providers / vendors and to determine their capabilities
- Implement IoT solutions for Sysmex devices in order to architect and engineer future-proof IoT solutions for connecting medical devices all over the world

Lead Engineer and Architect - Retail IoT/AI Edge - Video Analytics

Walgreens, Chicago, IL, USA (Apr 2022 - Sep 2022)

Missed Scans Detection at Checkout Counter Using Computer Vision

This highly complex project encompassed detecting missed items scans at the retail checkout counters to prevent mistakes and fraudulent activity. The checkout activity is monitored in real-time with the use of AI and Computer vision on the video feed acquired through overhead cameras.

- Utilized Nvidia GPUs to run multiple AI models for inference at the edge server for achieving sub second latency
- Handled live video stream from multiple Walgreens streams to slice POS transactions
- Integrated Walgreens systems with Azure IoT Edge platform to bring data to the Azure Edge
- Explored Azure Cognitive Services for computer vision as part of building the retail platform.

Lead Engineer and Architect - Azure IoT/AI Edge - Video Analytics

Microsoft, Seattle, WA, USA (Apr 2022 - Aug 2022)

Azure Percept, A Platform For Video Analytics At The Edge

This project required developing an Azure IoT Edge Module for users to build live streamed video analytics pipelines that can be deployed at the edge for various use cases. IoT module allows users to construct complex computer vision AI apps within hours instead of months.

- Utilized Nvidia Deepstream SDK to automatically construct video analytics pipeline from JSON
- Developed parsers for ONNX and TensorRT models and integrated object tracking
- Used technologies like Nvidia Deepstream, Triton Server, gStreamer, ffmpeg, Python multiprocessing, gRPC, RTSP video streams, video codecs, CUDA, Azure IoT Hub, Azure Edge, Azure Stream Analytics, Databases, Power BI and Nvidia Jetson

Senior Architect & Engineer - IoT/ML & Computer Vision Edge platform for Retail
LG Electronics, Santa Clara, CA, USA (March 2021 - February 2022)

LG Future Experiences (FX) Lab, is building an AI, Computer Vision and IoT driven Edge technology platform to revolutionize the shopping experience in retail stores with AI based shopping carts, cashierless checkouts, smart displays, loss prevention, video analytics, remote monitoring, smart shelves and more.

My responsibilities with the FX lab in Silicon Valley include the following:
- Architect Computer Vision pipeline for video processing on distributed compute clusters.
- Code multi-threaded and multi-processing python services for parallel computer vision workloads.
- Setup computer vision pipelines using technologies such as gStreamer, Nvidia DeepStream, AWS Kinesis Video Streams, AWS Greengrass, AWS Rekognition, Kafka and Azure Video Analyzer frameworks.
- Work with Vision developers and ML engineers to speed up the development and the deployment of Computer Vision processes and Machine Learning models on GPU based compute clusters.
- Containerize complex AI, ML and IoT services for production deployment.
- Implement Kubernetes based Edge and Cloud GPU/CPU compute clusters.
- Develop Zero-Touch deployments and self-healing IoT networks at retail locations.
- Architect Zero-Trust security for IoT devices, services and human operators.
- Implement observability of the entire system for immediate resolution of any issues.
- Capture and share best-practice knowledge amongst the engineering members.
- Help establish DevOps and MLOps best practices for eliminating development delays.
- Help develop an overall IoT and Mobile ecosystem engagement strategy for high ROI.
- In partnership with product managers and UX designers, formulate and execute product concept discovery and development for next billion dollars market potential.
- Act as a technical liaison between customers and FX engineering/PM members.
- Code, compile and deploy complex software components to build a highly scalable IoT platform.

Principal Architect and Engineer - IoT Edge Network for Retail Restaurants
Chick-Fil-A, Atlanta, GA, USA (October 2018 - March 2021)

Chick-Fil-A is a privately held fast-food restaurant chain operating more than 2400 restaurants in the United States. With over $10 Billion in revenues, Chick-fil-A leads the fast food industry in average sales per restaurant, despite being open only six days a week, grossing an average of $4 to $6 million per restaurant. This is more than the per store average of top 3 food chains combined i.e. McDonalds, Starbucks and Subway.

In order to further increase the serving capacity per restaurant and to run cost efficient operations, the company is building a state of the art Internet-of-Things (IoT) platform for restaurants. The IoT/Edge network connects all the things in the restaurants to the internet i.e. deep fryers, grills, ovens, hand sanitizers and baking stations etc. By deploying the IoT platform, the company will save $100 million to $150 million dollars / year in operating costs only with the low hanging fruit of the initial IoT use-cases. The value will continue to soar as the company builds better analytics and machine learning algorithms to extract business intelligence out of the IoT data.

My role with the company included engineering and architecting its IoT Edge platform using the latest tools and technologies such as Kubernetes, Prometheus, Elastic Search, Grafana, MQTT, oAuth for devices, CI/CD Pipelines, big data frameworks, network stack and Public/Private cloud. I also worked closely with the engineering teams of the company's vendors to ensure that the various restaurant equipment supplied by third parties could communicate with the Chick-Fil-A's IoT Edge network using the SDK in Go, Python and C (Cgo).

- Hands-on SDK development using Go, Cgo, Python, Shell scripting and AWS Services.
- Designed and developed a cloud based platform to certify 3rd party vendor devices for CFA IoT.
- Achieving automation with various DevOps tools for a very large multi-cloud deployment.
- Expert level skills for Native iOS, Android and Web development using Flutter framework.
- Extensive experience with Docker and Kubernetes (K8s) deployments.
- Architecting an enterprise edge network with hundreds of K8s clusters and bare metal nodes.
- Ingesting and analyzing streaming data from thousands of edge devices across the network.
- Building Identity and Access Management (IAM) for humans and machines.
- Developing a highly-available and secure cloud infrastructure for distributed edge computing.
- Coding, debugging and deploying cloud native micro-services utilizing various services such as Greengrass, ECR, EKS, SSM, DynamoDB, ACM, IAM, CloudWatch, Lambda, AWS CLI, CloudFormation, EC2, ELB, EBS and ElasticSearch

Chick-Fil-A is running over 2400 Kubernetes clusters with 7000+ nodes and tens of thousands of pods/containers in one of the largest and the most distributed compute networks. IoT security and network resilience were of paramount importance in our architectural decisions to ensure uninterrupted operation of each Chick-Fil-A restaurant. We ensured security through data encryption, firewalls, Public Key Infrastructure (PKI), short lived JSON Web Tokens (JWTs), credentials rotations, oAuth framework, secure certificates, enterprise WIFI connectivity, Role Based Access Control (RBAC), infrastructure hardening through penetration testing, resource isolation and threat detection through machine learning.

Senior IoT and Cloud Solutions Architect for Smart Buildings
Computime Industries Ltd, Hong Kong (August 2017 – September 2018)

Computime is a global industrial company developing IoT devices such as smart smoke alarms, smart thermostats, windows/door sensors, IoT Gateways and other HVAC devices. My responsibilities included overhauling the IoT and cloud development processes while setting up a future proof system architecture for building operators to manage ‘smart spaces’ in their buildings. The focus was to allow building owners/operators to cut energy and operational costs while making the experience of the residents more comfortable and enjoyable. The operator had deep insight into the data generated

through smart devices and the occupants' behavioral patterns, allowing the operators to make focused business decisions for future growth.

I worked hand in hand with multi-disciplinary global teams in Asia, Europe and North America to establish a more cohesive company wide approach from electronics to cloud development and from new product concepts to technical support. In just the first 8 months, I helped reduce the company's cloud support and maintenance costs by 50% as well as increasing the robustness, security and availability of the applications.

- Setup highly available, secure and scalable infrastructure (IAAS) on AWS and Google Cloud.
- On AWS, I used services like EC2, EBS, Lambda, S3, CodeCommit, Elastic Load Balancing, Auto Scaling, DynamoDB, IAM, CloudFormation, CloudFront, Route53, AWS IoT, SNS, SQS, RDS, API Gateway and other related services.
- Single-handedly migrated servers and applications from a co-location facility to the AWS cloud.
- Setup DevOps and continuous delivery pipelines (CI/CD) using Shell Scripts, Ansible, Jenkins, Chef, Puppet, Git, CodeBuild, CodeDeploy and CodePipeline.
- I also used various services on Google and Azure cloud such as Nginx, Docker Containers, Kubernetes, Google AppEngine, Content Delivery Network and Access Management etc.
- Coordinated with a global team of engineers working on electronics, firmware, mobile apps and cloud apps to bring more cohesiveness by utilizing tools like Git and Confluence.
- Organized and analyzed streaming data for real-time fault detection and historical usage trends with search tools like Splunk.
- Personally developed a Hyperledger Fabric prototype with a development environment like Angular and Ionic for the company's next generation IoT platform using blockchain.
- Worked towards the containerization of the platform using Docker and Kubernetes.
- Worked with the engineering team to integrate Alexa Voice Service (AVS) directly into the smart home hardware devices by creating interfaces for speech capture and speech output.
- Developed Smart Home Alexa Skills to interact with smart-home using voice commands.

IoT Consultant
Apptellect Inc (January 2011 – Present)

Consulted an established company to help streamline their IoT platforms by identifying architecture, design, security and the skills gaps in achieving scalability and stability for their systems. Worked closely with the leadership and the engineering team to help align the software/cloud development process with the leadership's vision to achieve desired business objectives and ROI from the company's IoT initiatives.

Principal IoT, Blockchain and Cloud Solutions Architect

Worked with various clients on a variety of IoT, mobile and Cloud projects in order to build modern mobile/web apps, IoT (Internet of Things) products and high-availability cloud solutions. This included electronics design, firmware development, mobile apps, telemetry data ingestion, server provisioning/maintenance and analytics. Also undertook several Blockchain projects using platforms such as Hyperledger Fabric. I am very familiar with other blockchain platforms such as Corda R3, Sawtooth and Ethereum. A few high profile projects are as follows:

BLOCKCHAIN LOYALTY PLATFORM
Working to develop a blockchain based marketing and loyalty platform to connect the social influencers with the businesses. The platform allows the influencers and the businesses to establish a working relationship using smart contracts without any lengthy and expensive negotiations. As part of the project I undertook the following activities:

- Defined and created a business network using Hyperledger Fabric.
- Hands on back-end business logic and 'smart contracts' development using Node.js
- Deployed various components of the system on IBM Cloud using Cloud Foundry and IBM Blockchain.
- Defined iOS/Android mobile apps using Angular and Cordova to interact with the Hyperledger Fabric network using the RESTful API.

Developed a network using Hyperledger Fabric, Hyperledger Composer, Docker, Java (Android), IBM Weather API, Watson Machine Learning, REST APIs and other related cloud technologies for an end-to-end fully functional platform to connect donors with monsoon devastated farmers.

HYPERLEDGER FABRIC BIOCKCHAIN NETWORK DISASTER RELIEF
Developed a network using Hyperledger Fabric, Hyperledger Composer, Docker, Java (Android), IBM Weather API, Watson Machine Learning, REST APIs and other related cloud technologies for an end-to-end fully functional platform to connect donors with victims of the natural disaster. The project was developed in response to the ‘Call For Code’ initiative from IBM and David Clark Cause.

FITNESS REPUBLIC:

- Helped a tech Startup (Fitness Republic) to setup cloud infrastructure for a pure Serverless backend using technologies such as EC2, Lambda, SSM, AWS API Gateway, DynamoDB, Cognito, Cloud Formation, Redis, ACM, Serverless framework, S3, SSM, IAM, Stripe payment APIs, Zendesk and JWT (auth tokens).

ZEALA CARE:

- Developed an IoT healthcare solution for long term care and assisted living facilities that monitors the patient's health using sensors such as diaper wetness, fall and motion. This project is using Zigbee and Thread IoT frameworks.

Completed 50+ web and mobile projects using technologies like AWS, Google Cloud Services, Angular, Objective C, Swift, Java for Android, Angular, Node.JS, PHP, MySQL and Cordova.

Co-Founder / CTO / IoT Architect for Smart Home devices

Heaven Fresh Canada Inc., Toronto, ON. Canada. (November 2012 – July 2017)

In this role, I established and implemented company-wide standards and practices related to the company technologies. I lead a team to develop the world's first AllJoyn certified wifi/cloud connected air purifiers and humidifiers. Utilizing the agile-methodology, my team and I built IoT and cloud connectivity into air purifiers, humidifiers, dehumidifiers, air conditioners and fridges. The appliances also interoperate with other Smart Home ecosystems such as Amazon Alexa, Google Home and Samsung SmartThings.

- Built and managed the R&D department to develop new ‘Smart Home’ devices that use the latest IoT technology and frameworks such as AllJoyn, MQTT, AWS IoT and Amazon Alexa. Team included electronics engineers, firmware engineers, iOS developers, Android developers,

Cloud developers (AWS, Azure) and voice application developers. The team consisted of onsite and remote engineers/developers.
- Performed cloud automation and DevOps with CI/CD through shell scripting and various automation tools.
- Very well versed in the latest smart home trends and active participant in various IoT standardization efforts such as OCF, Thread, Zigbee and Bluetooth Mesh.
- Evaluated various IoT technologies that were most suitable for appliances.
- Had discussions with retail buyers as well as end users about the direction of connected appliances. So, I designed the technical architecture based on business needs.
- Built cloud connectivity into air purifiers, humidifiers, dehumidifiers, air conditioners and fridges.
- Developed Amazon Alexa Skills using Alexa Skills Kit (ASK).

Co-Founder / CEO
Heaven Fresh Canada Inc., Toronto, ON. Canada. (Mar 03 – Nov 12)

As part of the core management team helped grow the company from humble beginnings to a multi-million dollar business operating three continents and 7 countries. Actively participated in managing the company P&L as well as the technical and the business strategy.

- Co-founded the company from the basement and took it to multi-million dollar revenues.
- Lead a team of 30+ people to set up an online presence in multiple languages including English, French, German and Arabic. State of the art online marketing techniques were developed for online selling and brand promotion. E-commerce sites were set up for the US, Canada, UK, Germany, France, Ireland and the UAE.
- Grew the global annual revenues into several million dollars by being involved in the product and business development process.
- Established distribution offices and sales offices globally in Canada, United States, Germany, United Kingdom, United Arab Emirates and Saudi Arabia. During the process I gained significant insight into developing new markets for company products and services.
- Built an international team and established Heaven Fresh as a vendor for The Home Depot, Walmart, Lowes. Bed Bath and Beyond, Best Buy, Costco Canada, The Shopping Channel (Largest Canadian TV retailer), Shoppers Drug Mart (900+ stores across Canada), Pharma Plus (300+ pharmacies), Boots (UK), Revital (UK), QVC (UK), Tesco, Menards and several others.
- Ran successful marketing, advertising and PR campaigns for an effective ROI.
- Developed a successful business model for a fast and extremely cost effective replication in new markets.
- Instituted a cloud ERP system (NetSuite) to manage all aspects of business and to share the business resources among international Heaven Fresh offices.
- Had hands-on involvement in automating every aspect of the business in order to deliver growth and profitability. This included product development, finance, operation and sales/marketing.

Independent Software Development Consultant *(May 02 – Feb 03)*

- Managed the development of several different web based projects. Development teams consisted of developers/designers on-site and different offshore locations.
- Promoted the e-commerce projects using various online marketing techniques.

Principal R&D Engineer – Voice & Visual applications
Kirusa Inc., Berkeley Heights, NJ. USA (Sep 2001 – April 2002)

My responsibilities were to develop advanced prototypes for multi-modal (voice & Visual) applications for mobile devices. This included working on the following technologies.

- Setup Voice recognition and Text-to-Speech (TTS) servers.
- Combined Voice and Visual browser to create seamless integration of HTML and VoiceXML for multi-modal application development.
- Client development for mobile devices to capture, synthesize and output speech by handling streaming data for voice recognition.
- A multi-threaded server capable of handling incoming requests from multiple clients. The server was developed in C++.
- Developing techniques to stream the voice data to the server in the shortest possible time and good enough quality to be recognized on the server.

Designed and implemented several components of a multi modal client/server platform. Also filed a patent on the “technique to bind standard visual browser (HTML) and voice browser (VoiceXML) to achieve multi-modality” (US Patent number 7,210,098).

Senior Software Engineer / Voice & Visual app platform
Auvo Technologies, Itasca, IL. USA (Dec 2000 – Sep 2001)

Worked as a senior member of the engineering team to develop a multi modal (voice & visual) application platform for various wireless networks.

- Developed a mobile client using embedded C/C++ to combine voice and visual interaction for multi-modal apps.. The responsibilities of the client were a) to decode the protocol messages to render the graphical widgets and text on the screen b) to encode the tactile inputs of the user into protocol messages to send to the server c) To input speech from the device and stream to the server for recognition.
- Designed communication protocol for a distributed client-management platform.
- Implemented the connection Manager to stream audio data over TCP/IP.
- Developed a telephony manager and wrote APIs to place phone calls..

Senior Software Engineer for Smart Large Scale Commercial Buildings
Siemens Buildings Technologies, Buffalo Grove, IL. USA (Aug 97 – Nov 00)

Siemens is the leader in automation of smart buildings, including some of the tallest high rise buildings and the largest sports stadiums in the world. The company has been pioneering the ‘smart building’ IoT concepts decades before IoT was a buzz word.

Designed and developed several different software tools for desktop and handheld computers to centrally manage various aspects of commercial buildings such as security, energy management , lighting and environment control (temperature, humidity, fresh air etc.) Also worked on a team project to migrate the company's Sales Estimating System from mainframe to Oracle based client server environment. Did extensive development with Oracle databases and Windows application development using Visual Basic, Visual C++ and other development tools.

Software Developer and Quality Control (Internship)
Panasonic Factory Automation, Franklin Park, IL. USA (Jan 96 – Dec 96)

- Developed/Debugged applications in Visual Basic, Visual C++.

Certificates and Awards

Certified Kubernetes Administrator (CKA)

- Credential ID: LF-3hvdqh27wb
- https://training.linuxfoundation.org/certification/verify/

AWS Certified Solutions Architect- Professional

- Validation Number YE5WYR1BM1VQ17G8
- https://www.certmetrics.com/amazon/public/transcript.aspx?transcript=GP4WSH1KCJQQ14GV

Winner of 'Challenge Accepted' by IBM and Global Citizen

- Won the top prize to build a blockchain network that allowed Governments, Non-profit organizations and Global citizens to effectively track, distribute and monitor the pledged donations. The network was developed using Hyperledger Fabric, and various other technology frameworks such as Angular, Loopback, Passport JS, Swagger, Yoman, NoSQL database and RESTful API.

Education

MIT Sloan School of Management

- Executive Education: IoT Business Implications and Opportunities

Illinois Institute of Technology, Chicago, Illinois. USA

- Bachelor of Science - Computer Engineering
- Completed coursework towards Master of Science in telecommunications and software engineering